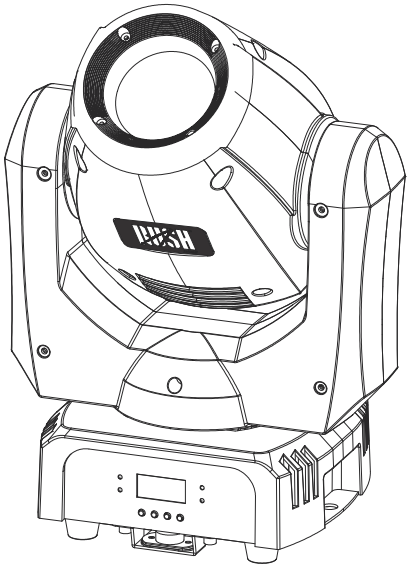
MH 5 Profile



User Manual

by Martin®

Professional Entertainment Technology

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Manual: Revision D

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Safety information

WARNING!

Read the safety precautions in this manual before installing, operating or servicing this product.

The following symbols are used to identify important safety information on the product and in this manual:

Warning!

Safety hazard. Risk of severe injury or death.

Warning!

Powerful light emission. Risk of eye injury.

Warning!

See user manual for important safety information.

Warning!

Hazardous voltage. Risk of lethal or severe electric shock.

Warning!

Hot surfaces and fire hazard.

Warning! Risk Group 2 product according to EN 62471. Do not look directly into the beam. Do not view the light output with optical instruments or any device that may concentrate the beam.

This lighting fixture is for professional use only and must be installed by a qualified technician. It is not for household use. It presents risks of severe injury or death due to fire hazards, electric shock and falls. It produces a powerful, concentrated beam of light that can create a fire hazard or a risk of eye injury if the safety precautions below are not followed.

Install, operate and service RUSH by Martin™ products only as directed in their user manuals, or you may create a safety hazard or cause damage that is not covered by product warranties.

Follow the safety precautions listed below and observe all warnings in this manual and printed on the product. Keep this user manual for future use.

For the latest user documentation and other information for this and all Martin™ products, please visit the Martin website at http://www.martin.com

If you have any questions about how to install, operate or service the fixture safely, please contact your Martin™ distributor (see www.martin.com/distributors for details) or call the Martin™ 24-hour service hotline on +45 8740 0000, or in the USA on 1-888-tech-180.

Respect all locally applicable laws, codes and regulations when installing, operating or servicing the fixture.

Protection from electric shock

Do not expose the fixture to rain or moisture.

Disconnect the fixture from AC power before carrying out any installation or maintenance work and when the fixture is not in use.

Ensure that the fixture is electrically connected to ground (earth).

Use only a source of AC power that complies with local building and electrical codes and has both overload and ground-fault (earth-fault) protection.

Socket outlets or external power switches used to supply the fixture with power must be located near the fixture and easily accessible so that the fixture can easily be disconnected from power.

Replace defective fuses with ones of the specified type and rating only.

Isolate the fixture from power immediately if the power plug or any seal, cover, cable, or other component is damaged, defective, deformed, wet or showing signs of overheating. Do not reapply power until repairs have been completed

Before using the fixture, check that all power distribution equipment and cables are in perfect condition and rated for the electrical requirements of all connected devices.

Use only Neutrik PowerCon cable connectors to connect to power sockets.

Do not connect devices to power in a chain that will exceed the electrical ratings of any cable or connector used in the chain.

The supplied power input cable is rated 6 A and can safely supply only one fixture with mains power. Do not connect any device to the fixture's MAINS OUT connector when using this cable. If you replace this cable and also use the replacement cable to supply only one fixture with mains power, the replacement cable must also be rated 6 A minimum, have three conductors 18 AWG or 0.75 mm² minimum conductor size, have an outer cable diameter of 6 - 15 mm (0.2 - 0.6 in.) and be temperature-rated to suit the application. In the USA and Canada the cable must be UL listed, type SJT or equivalent. In the EU the cable must be type H05VV-F or equivalent.

To connect fixtures to mains power in a chain, you must first obtain 14 AWG or 1.5 mm^2 power input and throughput cables that are 16 A rated and temperature-rated to suit the application. In the USA and Canada the cables must be UL-listed, type SJT or equivalent. In the EU the cables must be type H05VV-F or equivalent. Suitable cables with Neutrik PowerCon connectors are available from Martin™ (see 'Accessories' on page 41). If you use these cables, you can connect fixtures to power in a linked chain, MAINS OUT throughput socket to MAINS IN input socket, but do not link more than:

- eight (8) RUSH MH 5 fixtures in total at 100-120 V, or
- eighteen (18) RUSH MH 5 fixtures in total at 200-240 V.

The voltage and frequency at the MAINS OUT socket are the same as the voltage and frequency applied to the MAINS IN socket. Only connect devices to the MAINS OUT socket that accept this voltage and frequency.

Protection from burns and fire

Do not operate the fixture if the ambient temperature (T_a) exceeds 40° C (104° F).

The surface of the product casing can reach up to 60° C (140° F) during operation. Avoid contact by persons and materials. Allow the fixture to cool for at least 10 minutes before handling.

Keep flammable materials well away from the fixture. Keep all combustible materials (e.g. fabric, wood, paper) at least 100 mm (4 in.) away from the fixture head.

Ensure that there is free and unobstructed airflow around the fixture. Provide a minimum clearance of 100 mm (4 in.) around fans and air vents.

Do not illuminate surfaces within 200 mm (7.9 ins.) of the fixture.

Do not attempt to bypass thermostatic switches or fuses.

Do not stick filters, masks or other materials onto any optical component.

Protection from eye injury

Do not stare directly into the light output. Ensure that persons are not looking directly into the LEDs when the product lights up suddenly. This can happen when power is applied, when the product receives a DMX signal, or when certain control menu items are selected.

Do not look at the light output with magnifiers, telescopes, binoculars or similar optical instruments that may concentrate the light output.

To minimize the risk of eye irritation or injury, disconnect the fixture from power at all times when the fixture is not in use, and provide well-lit conditions to reduce the pupil diameter of anyone working on or near the fixture.

Protection from injury

Fasten the fixture securely to a fixed surface or structure when in use. The fixture is not portable when installed.

Ensure that any supporting structure and/or hardware used can hold at least 10 times the weight of all the devices they support.

If suspending from a rigging structure, fasten the fixture to a rigging clamp. Do not use safety cables as the primary means of support.

If the fixture is installed in a location where it may cause injury or damage if it falls, install as directed in this manual a secondary attachment such as a safety cable that will hold the fixture if a primary attachment fails. The secondary attachment must be approved by an official body such as TÜV as a safety attachment for the weight that it secures, must comply with EN 60598-2-17 Section 17.6.6 and must be capable of bearing a

static suspended load that is ten times the weight of the fixture and all installed accessories.

Allow enough clearance around the head to ensure that it cannot collide with an object or another fixture when it moves.

Check that all external covers and rigging hardware are securely fastened.

Do not operate the fixture with missing or damaged covers, shields or any optical component.

Block access below the work area and work from a stable platform whenever installing, servicing or moving the fixture.

Do not lift or carry the fixture by its head. Always ensure that the fixture is supported by its base.

In the event of an operating problem, stop using the fixture immediately and disconnect it from power. Do not attempt to use a fixture that is obviously damaged.

Do not modify the fixture or install other than genuine RUSH by Martin™ parts.

Refer any service operation not described in this manual to a qualified technician.

Introduction

The MH 5 Profile is a powerful profile fixture with a 75 W long-life LED engine light source. It has two gobo wheels, the first with seven rotating gobos and the second with eight static gobos. The fixture has two color wheels, each with seven colors plus open. It also has smooth electronic dimming, rotating prism effects, remote focus, iris and strobe effects. The fixture is rugged, lightweight and compact.

The fixture can be controlled using any DMX-compliant controller. It can also function without DMX control as a standalone device running one of four pre-programmed shows, with a sound activation option that lets you trigger scene changes with a music beat.

The fixture is supplied with this user manual, a 1.5 m (5 ft) power cable (local power plug not included) and an omega-type mounting bracket for rigging clamp attachment.

Using the product for the first time

1. Read 'Safety information' on page 5 before installing, powering, operating or servicing the fixture.
2. Unpack and ensure that there is no transportation damage before using the fixture. Do not attempt to operate a damaged fixture.
3. If the fixture is not going to be hard-wired to a mains supply, install a local power plug (not supplied) on the end of the supplied power cable.
4. Before operating, ensure that the voltage and frequency of the power supply match the power requirements of the fixture.
5. Check the RUSH support pages on the Martin Professional website at www.martin.com for the most recent user documentation and technical information about the fixture. RUSH by Martin™ user manual revisions are identified by the revision letter at the bottom of the inside cover.

Note that whenever AC power is applied to the fixture, it will reset all effects and functions to their home positions and the fixture head will move. This process usually takes around 20 seconds.

Physical installation

Read ‘Safety information’ on page 5 before installing the fixture.

The fixture is designed for indoor use only and must be used in a dry location with adequate ventilation. Ensure that none of the fixture’s ventilation slots are blocked.

Fasten the fixture to a secure structure or surface. Do not stand it on a surface or leave it where it can be moved or fall over. If you install the fixture in a location where it may cause injury or damage if it falls, secure it as directed in this user manual using a securely anchored safety cable that will hold the fixture if the primary fastening method fails.

Martin™ can supply safety cables and rigging clamps that are suitable for use with the fixture (see ‘Accessories’ on page 41).

Fastening the fixture to a flat surface

The fixture can be fastened to a hard, fixed, flat surface that is oriented at any angle. Ensure that the surface and all fasteners used can support at least 10 times the weight of all fixtures and equipment they will support.

Fasten the fixture securely. Do not stand it on a surface or leave it where it can be moved or fall over. If you install the fixture in a location where it may cause injury or damage if it falls, secure it as directed below with a securely anchored safety cable that will hold the fixture if the primary fastening method fails.

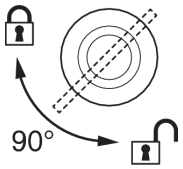
Mounting the fixture on a truss

The fixture can be clamped to a truss or similar rigging structure in any orientation. You must use a half-coupler clamp (see illustration on right) that completely encircles the truss chord.

To clamp the fixture to a truss:

1. Check that the rigging structure can support at least 10 times the weight of all fixtures and equipment to be installed on it.
2. Block access under the work area.

3. The fixture is supplied with an omega-type bracket to which a rigging clamp can be attached. Bolt a rigging clamp securely to the bracket. The bolt used must be M12, grade 8.8 steel minimum, and fastened with a self-locking nut.
4. Fasten the omega bracket to the base of the fixture using the bracket's quarter-turn fasteners. Turn quarter-turn fasteners a full 90° to lock them (see illustration on right).

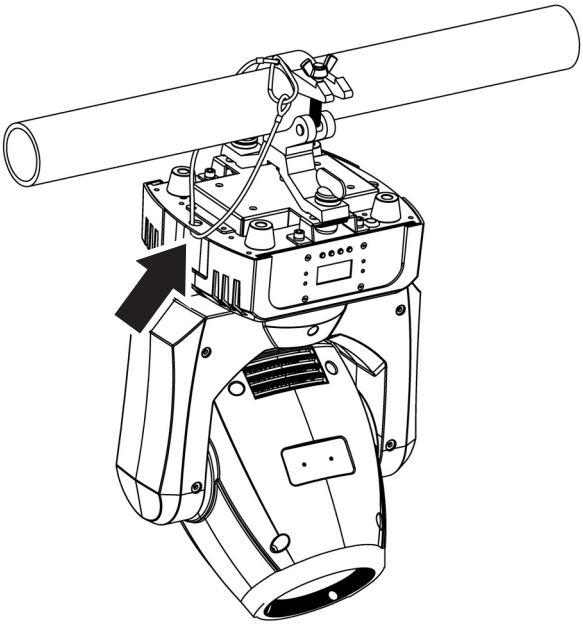


5. Working from a stable platform, hang the fixture on the truss and fasten the rigging clamp onto the truss.
6. Secure the fixture with a safety cable as directed below.
7. Check that the head will not collide with other fixtures or objects.

Securing with a safety cable

Secure the fixture with a safety cable (or other secondary attachment) that is approved for the weight of the fixture so that the safety cable will hold the fixture if the primary attachment fails. See illustration on right. Loop the safety cable through the cutout in the fixture's baseplate (arrowed) and around a secure anchoring point.

Martin™ can supply suitable safety cables and rigging clamps (see 'Accessories' on page 41).



AC power

Read ’Safety information’ on page 5 before connecting the fixture to AC mains power.

Warning! The mains power input cable supplied with the fixture is rated 6 A and can supply only one fixture with mains power. Do not connect any device to the fixture’s MAINS OUT power throughput socket when using this input cable. If you want to connect other fixtures to the MAINS OUT socket, see ‘Linking fixtures to power in a chain’ on page 14.

For protection from electric shock, the fixture must be grounded (earthed). The power distribution circuit must be equipped with a fuse or circuit breaker and ground-fault (earth-fault) protection.

Socket outlets or external power switches used to supply the fixture with power must be located near the fixture and easily accessible so that the fixtures can easily be disconnected from power.

Do not insert or remove live Neutrik PowerCon connectors to apply or cut power, as this may cause arcing at the terminals that will damage the connectors.

Do not use an external dimming system to supply power to the fixture, as this may cause damage to the fixture that is not covered by the product warranty.

The fixture can be hard-wired to a building electrical installation if you want to install it permanently, or a power plug (not supplied) that is suitable for the local power outlets can be installed on the power cable.

If you install a power plug on the power cable, install a grounding type (earthed) plug with integral cable grip that is rated minimum 250 V, 6 A. Follow the plug manufacturer’s instructions and connect the wires in the power cable as shown in this table:

	Live or L	**Neutral or N**	**Earth, Ground or ⏚**
US system	Black	White	Green
EU system	Brown	Blue	Yellow/green

The fixture has an auto-ranging power supply that accepts AC mains power at 100-240 V at 50/60 Hz. Do not apply AC mains power at any other voltage or frequency to the fixture.

Linking fixtures to power in a chain

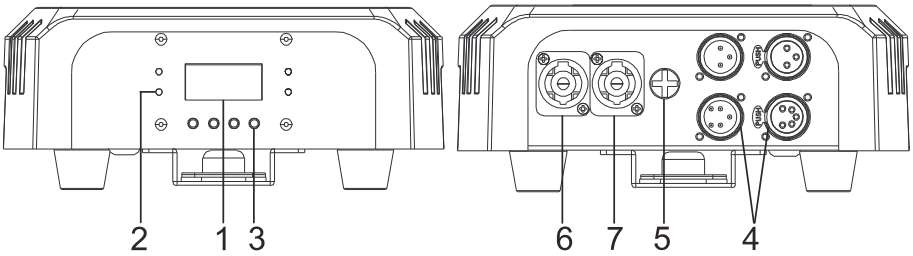
If you obtain a 14 AWG or 1.5mm^2 power input cable and 14 AWG or 1.5mm^2 throughput cables from Martin™ (see 'Accessories' on page 41), you can relay mains power from one fixture to another by connecting fixtures to power in a linked daisy-chain, MAINS OUT throughput socket to MAINS IN input socket.

Using 14 AWG or 1.5mm^2 cables from Martin™, you can link:

- Maximum eight (8) RUSH MH 5 fixtures in total at 100-120 V, or
- Maximum eighteen (18) RUSH MH 5 fixtures in total at 200-240 V.

If you install a power plug on the 14 AWG / 1.5 mm^2 power input cable, install a grounding type (earthed) plug with integral cable grip that is rated minimum 16 A, 250 V.

Fixture overview



1 - Display

2 - Status LEDs

The LEDs on the front of the base give the following indications:

DMX	On	DMX input present
MASTER	On	Master mode
SLAVE	On	Slave mode
SOUND	Flashing	Sound activation (Music trig)

3 – Control buttons

MENU	• Activate the menu mode functions, or • Return to the previous level of the menu structure, or • Press and hold to exit the menus
DOWN	Go down a menu branch
UP	Go up a menu branch
ENTER	Confirm the selected function

4 - DMX XLR input/output sockets

3 and 5-pin XLR sockets are provided for DMX input and output (throughput).

5 – Fuse

The fixture's T 3.15 A fuse is located in a fuseholder next to the power input/output connectors.

6 - Mains power input

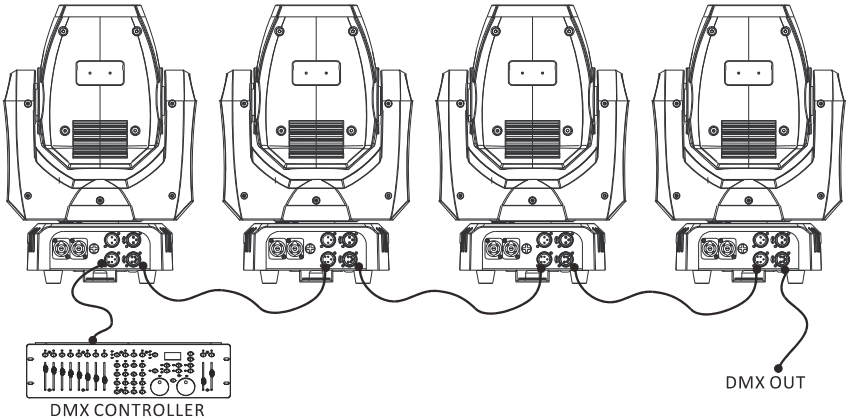
A blue Neutrik PowerCon socket is provided to connect the fixture to mains power.

7 – Mains power throughput

The white Neutrik PowerCon socket can be used to supply power to other fixtures only if you respect the safety precautions given in this manual (see 'Safety information' on page 5).

Control data link

A DMX 512 data link is required in order to control the fixture via DMX. The fixture has 3-pin and 5-pin XLR connectors for DMX data input and output.



The number of daisy-chained fixtures is limited by the number of DMX channels required by the fixtures in relation to the maximum 512 channels available in one DMX universe. Note that if independent control of a fixture is required, it must have its own DMX channels. Fixtures that are required to behave identically can share the same DMX address and channels. To add more fixtures or groups of fixtures when the above limit is reached, add a DMX universe and another daisy-chained link.

Tips for reliable data transmission

Use shielded twisted-pair cable designed for RS-485 devices: standard microphone cable cannot transmit control data reliably over long runs. 24 AWG cable is suitable for runs up to 300 meters (1000 ft.). Heavier gauge cable and/or an amplifier is recommended for longer runs. The pin-out on all connectors is pin 1 = shield, pin 2 = cold (-), and pin 3 = hot (+). Pins 4 and 5 in the 5-pin XLR connectors are not used in the fixture but are available for possible additional data signals as required by the DMX512-A standard. Standard pin-out is pin 4 = data 2 cold (-) and pin 5 = data 2 hot (+).

To split the link into branches, use a splitter such as the Martin 4-Channel Opto-Isolated RS-485 Splitter/Amplifier. Terminate the link by installing a DMX termination plug in the output socket of the last fixture. The termination plug, which is a male XLR plug with a 120 Ohm, 0.25 W resistor soldered between pins 2 and 3, “soaks up” the control signal so it does not reflect and cause interference. If a splitter is used, terminate each branch of the link.

Connecting the DMX data link

To connect the fixture to data:

1. Connect the DMX data output from the controller to the first fixture's male XLR DMX input connector.
2. Connect the first fixture's DMX output to the DMX input of the next fixture and continue connecting fixtures output to input. Terminate the last fixture on the link with a DMX termination plug.

Fixture setup

This section explains the fixture characteristics that can be set that determine how it can be controlled and will behave. These settings are made using the menus available from the control panel, and are retained, even when the fixture is powered off.

Only the most commonly used menu options for fixture setup are described in this section. A complete map of the control menu structure and brief explanations of their purposes can be found in 'Control menus' on page 35.

Using the control menus

To access the control menus, press the MENU button.

- Navigate the menu structure using the ENTER, DOWN and UP buttons.
- To select a menu option or to confirm a selection, press the ENTER button.
- To return to a higher level in the menu structure without making a change, press the MENU button.

To exit the control menus completely, press and hold the MENU button.

DMX function settings

DMX function settings include the DMX address and a DMX value viewer.

DMX addressing

The DMX address, also known as the start channel, is the first channel used to receive instructions from a DMX controller. The fixture can be controlled using signals sent by a DMX controller over 16 channels. Each DMX controlled fixture must have a DMX address set. For example, if a fixture has a DMX address of 10, then it uses channels 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24 and 25. The following fixture in the DMX chain can then be set to a DMX address of 26.

For independent control, each fixture must be assigned its own control channels. Two fixtures of the same type may share the same address, if identical behavior is desired. Address sharing can be useful for diagnostic purposes and symmetric control, particularly when combined with the inverse pan and tilt options.

The DMX address is configured using the DMX ADDRESS menu in the control panel.

To set the fixture's DMX address:

1. Select DMX ADDRESS and press ENTER to confirm. The present address will blink on the display.
2. Use the UP and DOWN buttons to select the address (1 to 512).
3. Press ENTER to confirm your selection.

Standalone show mode

The fixture has four preprogrammed shows stored in memory. Any of the shows can be set to run in standalone operation.

For the fixture to run a show in standalone mode, it must not be receiving a DMX signal and the DMX STATE menu setting (see below) must be set to MASTER/SLAVE.

You can run a standalone show automatically (auto trig), or you can synchronize the show with a music beat by setting the SOUND STATE menu (see below) to ON (music trig).

Selecting a standalone show

To select a show pre-programmed show that will run in standalone show mode:

1. Select SHOW MODE and press ENTER to confirm. The show that is currently set will blink in the display.
2. Use the DOWN and UP buttons to select Show 1, Show 2, Show 3 or Show 4.
3. Press ENTER to confirm your selection.

Master/Slave mode

You can synchronize the standalone shows of fixtures on a data link using Master/Slave mode. In this mode, the first fixture in the chain (the fixture that does not have a DMX signal or another powered on fixture connected to its DMX IN connector) runs a preprogrammed or sound-activated standalone show and the other fixtures run a standalone show that is synchronized with the first fixture.

To set up Master/Slave operation:

1. Check that fixtures are linked in a chain with a DMX data cable.
2. Set DMX STATE to MASTER/SLAVE on all fixtures and make sure that no DMX signal is present on the data link. The first fixture on the link will automatically act as master. All the other fixtures will act as slaves. Fixtures' MASTER and SLAVE LEDs light to indicate which mode they are operating in.
3. On the slave fixtures, use the UP and DOWN buttons to select from:
   - SLAVE 1 – fixture receives synchronizing information and runs the same show as the master fixture, or
   - SLAVE 2 – fixture receives synchronizing information and runs a show that is in sync with the master fixture's show but is not identical to it.
4. Press ENTER to confirm your selection.
5. Select a pre-programmed standalone show from Shows 1 – 4 on the Master fixture as described above, or set the Master fixture to run a sound-activated standalone show as described below.

Sound activation (music trig)

The fixture's built-in sound activation microphone can be used to trigger scene changes with a music beat or other sound source when a fixture is running a standalone show.

To set a chain of fixtures in Master/Slave mode to sound activation, you only need to set up the Master fixture. Slave fixtures will synchronize with the Master fixture.

When sound activation is running, the SOUND status LED on the control panel flashes in sync with the music beat.

To set sound activation:

1. Select SOUND STATE and press ENTER to confirm. The current setting will blink in the display.
2. Use the DOWN and UP buttons to select ON (sound activation enabled) or OFF (sound activation disabled).
3. Press ENTER to confirm your selection.

Sound activation microphone sensitivity

To adjust the sensitivity of the sound activation microphone:

1. Play some music at the normal volume for the venue.
2. Select SOUND SENSE and press ENTER to confirm. The current setting will blink on the display.

3. Use the DOWN and UP buttons to change the microphone sensitivity from 0 …100 until the fixture responds well to the music beat.
4. Press ENTER to confirm your selection.

DMX state (behavior when DMX signal stops)

You can define the behavior of the fixture if it is powered on and the DMX signal stops.

The fixture is set to Master/Slave by default.

To set fixture behavior if the DMX signal stops:

1. Select DMX STATE and press ENTER to confirm.
2. Use the UP and DOWN buttons to select:
   - MASTER/SLAVE – fixture runs in Master/Slave mode as described above. The first fixture on the link (master) automatically sends synchronizing information to other connected fixtures (slaves).
   - BLACKOUT – fixture blacks out.
   - HOLD – fixture continues to obey the last command that was sent via DMX.
3. Press ENTER to confirm (or press MENU to exit without making a change).

Pan/tilt inversion

The PAN INVERSE and TILT INVERSE menus can be used to reverse the direction of pan and tilt. These settings are useful for symmetrical effects with multiple fixtures, or when coordinating the movement of fixtures that are floor mounted and rigged upside down.

To adjust the pan inversion settings:

1. Select PAN INVERSE and press ENTER. The present mode will blink on the display.
2. Use the DOWN and UP buttons to select the YES (tilt inversion) or NO (normal) mode.
3. Press ENTER to confirm your selection.

To adjust the tilt inversion settings:

1. Select TILT INVERSE and press ENTER to confirm. The present mode will blink on the display.
2. Use the DOWN and UP buttons to select the YES (tilt inversion) or NO (normal) mode.
3. Press ENTER to confirm your selection.

Backlight

To adjust the backlight settings:

1. Select BACK LIGHT menu and press ENTER. The present mode will blink on the display.
2. Use the DOWN and UP buttons to select the ON (LED on) or OFF (LED off) mode.
3. Press ENTER to confirm your selection.

Setting focus for standalone shows

Focus during standalone shows can be set for each gobo wheel: wheel 1 (rotating gobos) and wheel 2 (static gobos).

To set the focus for the rotating gobo wheel:

1. Select FOCUS ADJUST and press ENTER.
2. Use the DOWN and UP buttons to change the focus point from 0…255.
3. Press ENTER to confirm the selected focus point.

To set the focus for the static gobo wheel:

1. Select FOCUS 2 ADJUST and press ENTER to confirm.
2. Use the DOWN and UP buttons to change the focus point from 0…255.
3. Press ENTER to confirm the selected focus point.

Dimmer Calibration

You can use the dimmer calibration feature to set the maximum light output level during standalone operation or to match output levels across multiple fixtures.

To set dimmer calibration:

1. Power the fixture on (if matching multiple fixtures, aim them so that their projections are side-by-side).
2. Select DIMMER CALIBRAT and press ENTER.
3. Using the DOWN and UP buttons, change the value from 50 …100 to adjust the maximum light level.
4. Press ENTER to confirm the maximum light level.

Dimmer speed

Dimmer speed provides two options:

- NO is the default setting. It sets the dimmer to exactly follow changes in dimming level sent from the controller. This gives the fastest dimmer response.

- YES adds a one-second (approx.) smooth fade to changes in dimming level sent from the controller. This gives the smoothest dimmer fading.

To set the dimmer speed:

1. Select DIMMER SPEED and press ENTER to confirm.
2. Use the DOWN and UP buttons to select YES or NO. Press ENTER to confirm.

Auto test

To perform a complete test of all of the fixture functions:

1. Select AUTO TEST and press ENTER.
2. Press ENTER again. The fixture will run a self-test routine.
3. Press MENU to exit the test.

Temperature

To check the onboard temperature of the fixture:

1. Select TEMP. and press ENTER. The display will show the temperature of the unit.
2. Press MENU to exit.

Fixture time

To display the fixture's operating hours counter:

1. Select FIXTURE TIME and press ENTER. The display will show the number of working hours of the unit.
2. Press MENU to exit.

Firmware version

To display the fixture's installed firmware version number:

1. Select FIRMWARE VERSION and press ENTER. The display will show the version of software of the unit.
2. Press MENU to exit.

Factory default settings

To return all the settings in the control menu to their factory defaults, cancelling any changes made by users:

1. Select DEFAULTS and press ENTER.
2. Select YES and press ENTER to confirm.

Manual reset

The fixture resets each time it is powered on, but you can also force a reset using the RESET menu. To force a reset, select RESET and press ENTER.

Effect home position adjustment

The effects (pan, tilt, color wheels, gobo wheels, gobos, focus, and prism) can lose their indexed home position. To reset any of these:

1. In the menu structure, press and hold ENTER for at least 3 seconds to enter the OFFSET MENU (see below).
2. Use the DOWN and UP buttons to scroll to the effect you want to adjust. Press ENTER to select it.
3. The current home position will flash in the display. Use the DOWN and UP buttons to adjust, then press ENTER to set (or press MENU to exit without making a change).

Effects

This section describes the main effects that you can control via DMX. See 'DMX protocol' on page 29 for a full list of DMX channels, DMX values and control options.

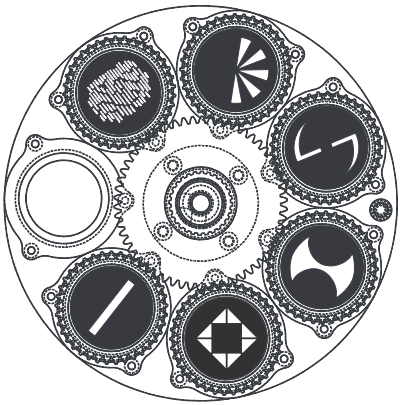
Electronic dimming

Overall intensity can be adjusted 0-100%.

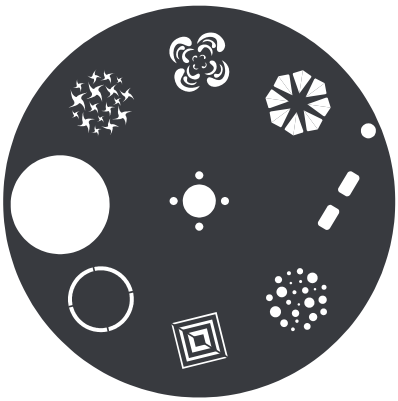
Gobos

The fixture contains two gobo wheels:

Gobo wheel 1 (rotating gobos)



Gobo wheel 2 (static gobos)



Individual gobos on wheel 1 can be rotated clockwise and counter-clockwise and a gobo shake function is available. Any gobo can be projected statically. Both gobo wheels can be rotated clockwise and counter-clockwise.

Color wheels

The fixture incorporates two color wheels, each with eight colors (including open/white). These can be individually selected, the wheels can be scrolled to give split colors, or the wheels can be rotated at varying speeds, both clockwise and counter-clockwise.

Focus

The motorized focus lets you adjust the sharpness of gobo projections.

Prism

The fixture incorporates a multi-facet prism than can be inserted into the beam, providing split effects. The prism can be set to an indexed position or rotated clockwise or counter-clockwise.

Strobe effects

The strobe effects provide instant open and blackout as well as variable speed regular and random strobe.

Pan and tilt

The fixture's moving head can be panned through 540° and tilted through 270° using coarse (8-bit) or fine (16-bit) DMX control channels.

The fixture incorporates pan and tilt feedback, so that if a pan or tilt position error is detected, the shutter closes and the fixture resets to the correct pan & tilt position. This can be disabled if not required (see 'Control menus' on page 35).

Maintenance

Read ‘Safety information’ on page 5 before servicing the fixture.

Service fixtures in an area where there is no risk of injury from failing parts, tools or other materials.

Refer any service or repair operation not described in this manual to an authorized RUSH by Martin™ service technician. Do not try to carry out such an operation yourself, as doing so may present a health or safety risk. It may also cause damage or malfunction, and it may void your product warranty.

Installation, on-site service and maintenance can be provided worldwide by the Martin Professional Global Service organization and its approved agents, giving owners access to Martin’s expertise and product knowledge in a partnership that will ensure the highest level of performance throughout the product’s lifetime. Please contact your RUSH by Martin supplier for details.

Cleaning

Excessive dust, smoke fluid, and particle buildup degrades performance, causes overheating and will damage the fixture. Damage caused by inadequate cleaning or maintenance is not covered by the product warranty.

The cleaning of external optical lenses must be carried out periodically to optimize light output. Cleaning schedules for lighting fixtures vary greatly depending on the operating environment. It is therefore impossible to specify precise cleaning intervals for the fixture. Environmental factors that may result in a need for frequent cleaning include:

- Use of smoke or fog machines.
- High airflow rates (near air conditioning vents, for example).
- Presence of cigarette smoke.
- Airborne dust (from stage effects, building structures and fittings or the natural environment at outdoor events, for example).

If one or more of these factors is present, inspect fixtures within their first 100 hours of operation to see whether cleaning is necessary. Check again at frequent intervals. This procedure will allow you to assess cleaning requirements in your particular situation. If in doubt, consult your RUSH by Martin dealer about a suitable maintenance schedule.

Use gentle pressure only when cleaning, and work in a clean, well-lit area. Do not use any product that contains solvents or abrasives, as these can cause surface damage.

To clean the fixture:

1. Disconnect the fixture from power and allow it to cool for at least 10 minutes.
2. Vacuum or gently blow away dust and loose particles from the outside of the fixture and the air vents at the back and sides of the head and in the base with low-pressure compressed air.
3. Clean the LED lenses by wiping gently with a soft, clean lint-free cloth moistened with a weak detergent solution. Do not rub the surface hard: lift particles off with a soft repeated press. Dry with a soft, clean, lint-free cloth or low-pressure compressed air. Remove stuck particles with an unscented tissue or cotton swab moistened with glass cleaner or distilled water.
4. Check that the fixture is dry before reapplying power.

Fuse replacement

If you need to replace a fuse:

1. Disconnect the fixture from power and allow it to cool for at least 10 minutes.
2. Unscrew the cap of the fuseholder (see Fixture overview on page 14) and remove the fuse. Replace with a fuse of the same size and rating only.
3. Reinstall the fuseholder cap before reapplying power.

Gobo replacement

Optical components have fragile coatings and are exposed to very high temperatures. Handle and store components with care. Wear cotton gloves while handling them. Keep them perfectly clean and free of oil and grease to reduce the risk of heat damage.

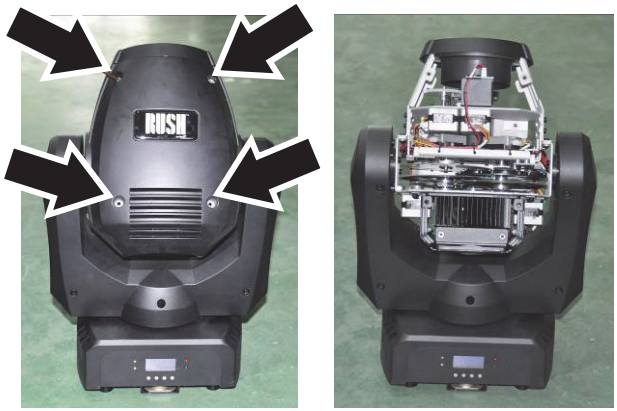
The rotating gobos can be replaced with custom aluminum gobos in the following size:

- Gobo size: 24 mm (0.94 in.)
- Gobo image size: 20 mm (0.79 in.)
- Gobo thickness: 0.3 mm

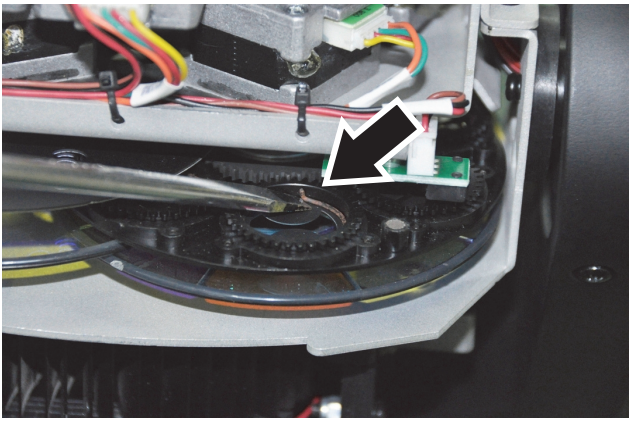
Gobos are exposed to thermal stress. Custom gobos must be constructed to the same quality standards as the original items.

To replace a rotating gobo:

1. Disconnect the fixture from power and allow it to cool for at least 10 minutes.
2. See illustration below. Remove the fixture head covers using a Phillips screwdriver.



3. The rotating gobos sit in goboholders that slot into the rotating gobo wheel. Note the position of the gobo – you will need to reinstall it in the same orientation. Lift out the goboholder that contains the gobo that is to be replaced.
4. See illustration below. The gobo is held in place in the goboholder by a wire clip. Taking care to avoid scratching or applying pressure to the gobo, remove the clip and lift the gobo out of the goboholder.



5. Place the new gobo in the goboholder and reinstall the wire clip. Check that it is clipped fully into its grooved seating and replace the goboholder in the rotating gobo wheel in its original orientation.
6. Replace the head covers and be ready for the head to move when the product resets when you reapply power.

DMX protocol

Chan.	Value	Function
1	0-255	Dimmer, coarse, 0-100%
2	0-255	Dimmer, fine
3		**Strobe**
	0-7	Off
	8-15	Open
	16-131	Strobe, slow→fast
	132-167	Fast close, slow open
	168-203	Slow close, fast open
	204-239	Pulse open and close
	240-247	Random strobe
	248-255	Open
4		**Color wheel 1**
		Continuous scrolling
	0	White
	1-14	White → Red
	15	Red (Color 1)
	16-29	Red → Deep Blue
	30	Deep Blue (Color 2)
	31-44	Deep Blue → Lavender
	45	Lavender (Color 3)
	46-59	Lavender → Magenta
	60	Magenta (Color 4)
	61-74	Magenta → Yellow
	75	Yellow (Color 5)
	76-89	Yellow → Orange
	90	Orange (Color 6)
	91-104	Orange → Light Green
	105	Light Green (Color 7)
	106-119	Light Green → Light blue
	120	Light blue (Color 8)
	121-134	Light blue → White
	135-160	White
		Stepped scrolling
	161-163	Color 1 - Red
	164-166	Color 2 - Deep Blue
	167-169	Color 3 - Lavender

Chan.	Value	Function
	170-172	Color 4 - Magenta
	173-175	Color 5 - Yellow
	176-178	Color 6 - Orange
	179-181	Color 7 - Light Green
	182-184	Color 8 - Light blue
	185-192	White
		Continuous rotation
	193-214	Clockwise, fast→slow
	215-221	Stop
	222-243	Counter-clockwise, slow→fast
		Random color
	244-247	Fast
	248-251	Medium
	252-255	Slow
5		**Color wheel 2**
		Continuous scrolling
	0	White
	1-14	White → Pink
	15	Pink (Color 1)
	16-29	Pink → CTO 3200K
	30	CTO 3200K (Color 2)
	31-44	CTO 3200K → UV Purple
	45	UV Purple (Color 3)
	46-59	UV Purple → Light Yellow
	60	Light Yellow (Color 4)
	61-74	Light Yellow → Green
	75	Green (Color 5)
	76-89	Green → Aquamarine
	90	Aquamarine (Color 6)
	91-104	Aquamarine → CTO 5600K
	105	CTO 5600K (Color 7)
	106-119	CTO 5600K → Blue
	120	Blue (Color 8)
	121-134	Blue → White
	135-160	White
		Stepped scrolling
	161-163	Color 1 - Pink
	164-166	Color 2 - CTO 3200K
	167-169	Color 3 – UV Purple
	170-172	Color 4 - Light yellow

Chan.	Value	Function
	173-175	Color 5 - Green
	176-178	Color 6 - Aquamarine
	179-181	Color 7 - CTO 5600K
	182-184	Color 8 - Blue
	185-192	White
		Continuous rotation
	193-214	Clockwise, fast→slow
	215-221	Stop
	222-243	Counter-clockwise, slow→fast
		Random color
	244-247	Fast
	248-251	Medium
	252-255	Slow
6		**Gobo wheel 1 (rotating gobos)**
		Gobo selection
	0-4	Open
	5-9	Gobo 1
	10-14	Gobo 2
	15-19	Gobo 3
	20-24	Gobo 4
	25-29	Gobo 5
	30-34	Gobo 6
		Gobo rotation (set direction and speed on channel 7)
	35-39	Gobo 1
	40-44	Gobo 2
	45-49	Gobo 3
	50-54	Gobo 4
	55-59	Gobo 5
	60-64	Gobo 6
		Gobo shake
	65-88	Gobo 1 shake
	89-112	Gobo 2 shake
	113-136	Gobo 3 shake
	137-160	Gobo 4 shake
	161-184	Gobo 5 shake
	185-208	Gobo 6 shake
	209	*No function*
		Continuous wheel rotation
	210-232	clockwise, fast→slow

Chan.	Value	Function
	233-255	counter clockwise, slow→fast
7		**Gobo wheel 1 indexing/rotation**
		Wheel indexing
	0-255	Indexed position, 0°→180°
		Wheel rotation
	0-2	No rotation
	3-126	Clockwise rotation, fast→slow
	127-129	Stop
	130-253	Counter-clockwise rotation, slow→fast
	254-255	Stop
8		**Gobo wheel 2 (static gobos)**
		Continuous scrolling
	0	Open
	1-14	Open → Gobo1
	15	Gobo 1
	16-29	Gobo 1 → Gobo 2
	30	Gobo 2
	31-44	Gobo 2 → Gobo 3
	45	Gobo 3
	46-59	Gobo 3 → Gobo 4
	60	Gobo 4
	61-74	Gobo 4 → Gobo 5
	75	Gobo 5
	76-89	Gobo 5 → Gobo 6
	90	Gobo 6
	91-104	Gobo 6 → Gobo 7
	105	Gobo 7
	106-119	Gobo 7 → Open
	120-160	Open
		Stepped scrolling
	161-163	Gobo 1
	164-166	Gobo 2
	167-169	Gobo 3
	170-172	Gobo 4
	173-175	Gobo 5
	176-178	Gobo 6
	179-181	Gobo 7
	182-192	Open
		Continuous wheel rotation
	193-214	Clockwise, fast→slow

Chan.	Value	Function
	215-221	Stop
	222-243	Counter-clockwise, slow→fast
		Random gobo
	244-247	Fast
	248-251	Medium
	252-255	Slow
9		**Prism**
	0-10	Open
	11-138	Prism indexing (set angle on channel 10)
	139-255	Prism rotation (set direction and speed on channel 10)
10		**Prism indexing / rotation**
		Prism indexing angle
	0-255	Indexed position 0°→180°
		Prism rotation direction and speed
	0-2	No rotation
	3-126	Clockwise rotation, fast→slow
	127-129	Stop
	130-253	Counter-clockwise rotation, slow→fast
	254-255	Stop
11	0-255	**Focus**, infinity → near
12	0-255	**Pan** 0°→540°
13	0-255	Pan (fine control)
14	0-255	**Tilt** 0°→270°
15	0-255	Tilt (fine control)
16		**Functions / fixture settings**
	0-9	*No function*
	10-14	Reset all
	15-19	Reset color
	20-24	Reset gobo
	25-29	Reset focus
	30-34	Reset prism
	35-39	Reset pan/tilt
	40-54	*No function*
	55-59	Enable calibration
	60-79	*No function*
	80-84	Pan/tilt speed = Normal
	85-89	Pan/tilt speed = Fast (default setting)
	90-94	Pan/tilt speed = Slow
	95-99	Parameter shortcuts = On (default setting)

Chan.	Value	Function
	100-104	Parameter shortcuts = Off
	105-144	*No function*
	145-149	Blackout = On (fixture goes to standby when no DMX signal)
	150-154	Blackout = Off (default setting: fixture enters standalone operation when no DMX signal)
	155-159	Illuminate control panel display
	160-164	Turn off control panel display
	165-194	*No function*
	195-199	Store color wheel 1 calibration
	200-204	Store color wheel 2 calibration
	205-209	Store gobo wheel 1 wheel calibration
	210-214	Store gobo wheel 1 gobo calibration
	215-219	Store gobo wheel 2 calibration
	220-224	Store focus calibration
	225-229	Store prism calibration
	230-234	Store prism rotation calibration
	235-239	Store pan calibration
	240-244	Store tilt calibration
	245-249	Reset all calibration settings to factory defaults
	250-255	*No function*

Control menus

To access the control menus, press the MENU button. Use the UP and DOWN buttons to navigate the menus. Select any required menu option using the ENTER button. For more information, see 'Using the control menus' on page 17.

Default fixture settings are shown in **bold**.

Menu	Sub-menu	Explanation
DMX Address	001–512	Fixture DMX address setting
Show Mode	Show 1…Show 4	Show 1 to 4
Slave Mode	Slave 1	Fixture copies the master in master/slave operation
	Slave 2	Fixture copies the master with slight variations in master/slave operation
DMX State	**Master/Slave**	**If DMX signal stops, fixture enters master/slave mode**
	Blackout	If DMX signal stops, fixture blacks out
	Hold	If DMX signal stops, fixture continues to obey the last command it received via DMX
Sound State	On	Sound activation (music trig)
	Off	No sound activation
Sound Sense	0…100	Microphone sensitivity for sound activation
Pan Inverse	Yes	Invert pan control
	No	Normal pan control
Tilt Inverse	Yes	Invert tilt control
	No	Normal tilt control
Back light	On	Control panel display backlight on
	Off	Display backlight off
Focus Adjust	0–255	Gobo wheel 1 focus in standalone mode
Focus 2 Adjust	0–255	Gobo wheel 2 focus in standalone mode
Dimmer Calibrat.	50–100	Dimmer calibration
Dimmer Speed	**No**	Dimmer optimized for speed
	Yes	Dimmer optimized for smoothness
Auto test		Automatic test of all functions

Menu	Sub-menu	Explanation
Temp.		Onboard temperature sensor readout
Fixture Time		Fixture operating hour counter
Firmware Version		Current installed firmware version
Defaults	Yes	Restore factory default settings
	No	
Reset		Reset fixture

Offset adjustment

The Offset menu is used to adjust the home position of the various effects. See table below.

To access the Offset menu:

1. Press the MENU button to enter the menu structure.
2. Press and hold the ENTER button for at least three seconds.

Menu	Sub-menu	Setting	Explanation
Offset	Pan	-127 → 127	Pan position
	Tilt	-127 → 127	Tilt position
	Color 1	-127 → 127	Color wheel 1 position
	Color 2	-127 → 127	Color wheel 2 position
	Gobo 1	-127 → 127	Rotating gobo wheel: wheel position
	R Gobo 1	-127 → 127	Rotating gobo wheel: gobo position
	Gobo 2	-127 → 127	Static gobo wheel position
	Prism	0 → 255	Prism indexed position
	R prism	-127 → 127	Prism rotation position
	Focus	0 → 255	Focus position

Troubleshooting

This section describes a few common problems that may occur during operation and provides some suggestions for easy troubleshooting:

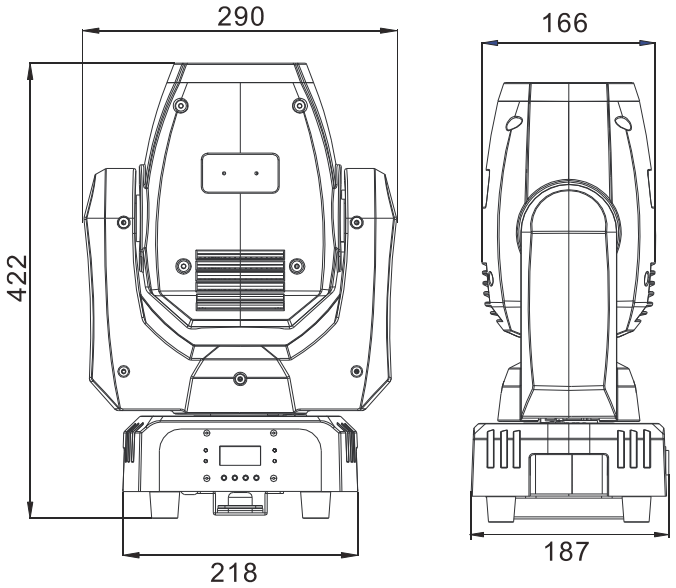
Symptom	Potential cause	Remedies
No light from fixture, or fans not working.	Power supply issue, such as blown fuse, faulty connector or damaged cable.	Ensure that mains supply is connected and supplying power to fixture. Ensure that fixture's power on LED is lit. Check all power connections and cables. Replace fixture fuse.
Fixture does not respond correctly to DMX control.	Fault on DMX link, or incorrect DMX addressing, or potential interference from proximity to a high voltage installation.	Check that fixture DMX LED is on. If not, check all cables and connections on DMX link. Ensure that DMX link is terminated. Check that all devices on DMX link use standard DMX polarity. Ensure that fixture is set to correct DMX address, one that matches address set on DMX control device. Try to control fixture with another DMX control device. Move fixture and DMX link if close to an unshielded high-voltage installation.
	Fixture fault	Contact your RUSH by Martin authorized distributor or service center for assistance.

Symptom	Potential cause	Remedies
Fixture does not react to music beat.	Sound activation disabled. Sound activation sensitivity too low for music source.	Ensure that fixture is not connected to a DMX signal. Adjust sound activation microphone sensitivity Test microphone by tapping fixture. Fixture should react when in sound activation mode.

Specifications

Physical

Weight ..... 9 kg (19.9 lbs.)
Dimensions..... 290 x 187 x 422 mm (11.4 x 7.4 x 16.6 in.)



Dynamic Effects

Color wheel 1 ..... 8 colors plus open, rotation with variable direction and speed
Color wheel 2 ..... 8 colors (incl. 1 x UV, 2 x CTC) plus open, rotation with variable direction and speed
Rotating gobo wheel..... 6 gobos plus open, wheel rotation, gobo rotation and shake
Static gobo wheel..... 7 gobos plus open, wheel rotation and shake
Electronic 'shutter' effect ..... Strobe effect, pulse effects, instant open and blackout
Prism ..... Indexing and rotation with variable direction and speed
Focus..... Motorized
Electronic dimming..... 0 - 100%, four dimming curve options

Pan ..... 540°, coarse & fine control and speed
Tilt ..... 270°, coarse & fine control and speed

Control and Programming

Control options ..... DMX, stand-alone, synchronized master/slave
DMX channels 16
Stand-alone trigger options ..... Sound activation (music trig), auto trig
Stand-alone sequences ..... 4 pre-programmed shows
Stand-alone memory ..... 20 scenes
Music trig sensitivity ..... Adjustable
Setting and addressing ..... Control panel with backlit LCD display
DMX compliance ..... USITT DMX512/1990

Optics and Photometric Data

Light source ..... 75 W LED engine
Minimum LED lifetime ..... 50 000 hours (to >70% luminous output)*
Rotating gobo size ..... 24 mm (0.94 in.)
Rotating gobo image size ..... 20 mm (0.79 in.)

**Figure obtained under manufacturer´s test conditions*

Construction

Color ..... Black
Housing ..... High-impact flame-retardant thermoplastic
Protection rating ..... IP 20

Installation

Mounting points ..... Quarter-turn bracket locking points
Location ..... Indoor use only, must be fastened to surface or structure
Orientation ..... Any

Connections

AC power input ..... Neutrik PowerCon
AC power throughput ..... Neutrik PowerCon
DMX data in/out ..... 3-pin & 5-pin locking XLR

Electrical

AC power ..... 100-240 V nominal, 50/60 Hz
Power consumption ..... 157 W
Fuse ..... T 3.15 A
Power supply unit ..... Auto-ranging electronic switch mode

Typical power and current

100 V, 60 Hz..... 1.6 A, 157 W, PF 0.998
120 V, 60 Hz..... 1.3 A, 155 W, PF 0.990
230 V, 50 Hz..... 0.8 A, 153 W, PF 0.939

Figures obtained at nominal voltage. Figures are typical, not maximum, allow for +/- 10% variation

Thermal

Cooling ..... Forced air
Maximum ambient temperature (T_a max.).....40° C (104° F)
Minimum ambient temperature (T_a min).....0°C (32° F)
Total heat dissipation .....560 BTU/hr.*

**Calculated, +/- 10%, at full intensity*

Approvals

EU safety..... EN 60598-2-17 (EN 60598-1), EN 62471, EN 62493
EU EMC .....EN 55015, EN 55103-1, EN 55103-2, EN 61000-3-2, EN 61000-3-3, EN 61547
US safety.....UL 1573
US EMC ..... FCC Part 15 Class A
Canadian safety .....CSA C22.2 No. 166
Canadian EMC .....ICES-003 Class A
Australia/NZ..... C-TICK N4241

Included Items

Power cable, 6 A, 18 AWG, 0.75 mm^2, UL- listed, H05VV-F, 1.5 m, without mains plug
Omega bracket for rigging clamp attachment

Accessories

Cables, 16 A, for connection to power in chains

Power input cable, 14 AWG, SJT, 1.5 mm2, H05VV-F, with PowerCon input connector, 3 m (9.8 ft.).....P/N 11541508
Power relay cable, 14 AWG, SJT, 1.5 mm2, H05VV-F, with PowerCon connectors, 1.4 m (4.6 ft.).....P/N 11541509
Power relay cable, 14 AWG, SJT, 1.5 mm2, H05VV-F, with PowerCon connectors, 2.25 m (7.4 ft.).....P/N 11541510
Power relay cable, 14 AWG, SJT, 1.5 mm2, H05VV-F, with PowerCon connectors, 3.25 m (10.7 ft.).....P/N 11541511

Power connectors

Neutrik PowerCon NAC3FCA
power input connector, cable mount, blue ..... P/N 05342804

Neutrik PowerCon NAC3FCB
power output connector, cable mount, light grey ..... P/N 05342805

Installation hardware

Half-coupler rigging clamp..... P/N 91602005
Safety wire, safe working load 50 kg..... P/N 91604003

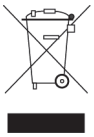
Related Items

RUSH Software Uploader 1™..... P/N 91611399

Ordering Information

RUSH MH 5 Profile™ in cardboard box, EU..... P/N 90280040
RUSH MH 5 Profile™ in cardboard box, US..... P/N 90280045

Specifications are subject to change without notice. For the latest product specifications, see www.martin.com



Disposing of this product

RUSH by Martin™ products are supplied in compliance with Directive 2012/19/EC of the European Parliament and of the Council of the European Union on WEEE (Waste Electrical and Electronic Equipment), where applicable. Help preserve the environment! Ensure that this product is recycled at the end of its life. Your supplier can give details of local arrangements for the disposal of RUSH by Martin products

Photobiological Safety Warning

The label shown below is displayed on this product. If it becomes difficult or impossible to read, it must be replaced using the illustration below to reproduce a new label sized 45 x 18 mm, in black on a yellow background.

RISK GROUP 2

CAUTION. Possibly hazardous radiation emitted from this product.

Do not stare at operating lamp. May be harmful to the eyes.

Innovation • Quality • Performance